Report Date: 30 Jun 2014

Summary Report for Individual Task
551-88L-3053
Troubleshoot a Ramp System
Status: Approved

Condition: Given a ramp system aboard a vessel, at sea, at anchor or moored alongside a pier, day or night, under all sea and weather conditions, while wearing appropriate PPE, (i.e. hearing protection, Nitrile gloves, eye protection, etc.), with a lock out tag out kit, marine rail tool box.

Standard: The Soldier correctly conducts troubleshooting procedures pertaining to a ramp system aboard an Army vessel, IAW the appropriate Technical Manual and local SOPs, without injury to self or others and without damage to equipment.

Special Condition: None

Safety Risk: Medium

MOPP 4:

Task Statements

Cue: None

DANGER

None

WARNING

None

CAUTION

None

Remarks: None

Notes: None

Performance Steps

1. Demonstrate troubleshooting procedures for the hydraulic system.

a. No pressure in hydraulic system.

(1) Possible cause(s):

(a) Check for loss of power.

(b) Check for low hydraulic level in reservoir tank.

(c) Check to see if the suction strainer elements are dirty.

(d) Check for pressure relief valve malfunction.

(e) Check for free re-circulation of hydraulic fluid to reservoir tank occurring in hydraulic system due to valve stuck in open position.

(f) Check for air leak in suction line, preventing priming, or causing noise and irregular action of control- circuit.

(g) Check to see if hydraulic fluid viscosity is too heavy to pick up prime (especially in cold weather).

(h) Check for wrong direction of hydraulic pump rotation.

(i) Check for broken shaft or parts inside hydraulic pump.

(2) Corrective action(s):

(a) Energize hydraulic system.

(b) Check hydraulic system for leaks and replenish as necessary.

(c) Clean or replace suction elements.

(d) Relief valve malfunction:

_1_ If valve pressure setting is incorrect, reset valve pressure to specification.

_2_ If valve is leaking, check valve seat for scoring and dirt. Clean or replace valve.

_3_ If valve spring is broken, replace valve.

(e) Inspect pilot operated check valve and pressure relief valve. Repair or replace defective valves.

(f) Repair leak or replace line.

(g) Use lighter viscosity hydraulic fluid.

(h) Reverse direction rotation by reversing controlling pipes connected to hydraulic pump.

(i) Replace hydraulic pump.

b. Low pressure in hydraulic system.

(1) Possible cause(s):

(a) Check to see if the suction valves are open.

(b) Check the hydraulic oil level in the reservoir.

(c) Check to see if pressure relief valve pressure set too low.

(d) Check for excessive external leakage.

(e) Check for worn hydraulic pump.

(2) Corrective action(s):

(a) Open the suction valves.

(b) Replenish the oil as required.

(c) Adjust valve pressure.

(d) Excessive external leakage.

_1_ Secure connections.

_2_ Check hydraulic fluid level.

(e) Replace hydraulic pump.

c. Erratic pressure in-hydraulic system.

(1) Possible cause(s).

(a) Check for air in hydraulic fluid.

(b) Check for contamination in hydraulic fluid.

(c) Check for worn hydraulic pump or hydraulic motor.

(2) Corrective action(s):

(a) Air in hydraulic fluid.

_1_ Secure connections.

_2_ Check hydraulic fluid level.

(b) Contamination in hydraulic fluid.

_1_ Clean or replace dirty elements or filters.

_2_ Change hydraulic fluid.

(c) Worn hydraulic pump or hydraulic motor.

_1_ Replace hydraulic pump.

_2_ Replace hydraulic motor.

d. Excessive pressure in hydraulic system.

(1) Possible cause(s):

(a) Check for pressure relief valve misadjustment.

(b) Check for worn pressure relief valve.

(2) Corrective action(s):

(a) Adjust pressure relief valve.

(b) Replace pressure relief valve.

e. Excessive temperature in hydraulic system.

(1) Possible cause(s):

(a) Check to see if hydraulic system pressure is too high.

(b) Check to see if pressure relief valve pressure is set too high.

(c) Check for cavitation (vacuums in hydraulic fluid).

(d) Check for air in hydraulic fluid.

(e) Check to see if hydraulic fluid is low.

(f) Check to see if hydraulic fluid is dirty.

(g) Check for worn or broken hydraulic pump.

(h) Check for worn or broken hydraulic pump.

(2) Corrective action(s):

(a) Hydraulic system pressure is too high.

_1_ Check hydraulic system pressure.

_2_ Check pressure settings of valves. Adjust pressure settings as required.

(b) Adjust pressure settings of pressure relief valve.

(c) Cavitation (vacuums in hydraulic fluid).

_1_ Clean or replace dirty air breather filter.

_2_ Clean or replace dirty filters and elements.

(d) Air in hydraulic fluid.

_1_ Secure inlet fittings.

_2_ Check hydraulic fluid level.

_3_ Bleed air from hydraulic system.

(e) Hydraulic fluid is low.

_1_ Check for leaks in hydraulic system.

_2_ Add hydraulic fluid.

(f) Hydraulic fluid is dirty.

_1_ Clean or replace dirty filters and elements.

_2_ bChange hydraulic fluid.

(g) Replace hydraulic pump.

(h) Replace hydraulic-motor.

f. Hydraulic fluid does not flow.

(1) Possible cause(s):

(a) Check to see if hydraulic pump is not receiving hydraulic fluid.

(b) Check to see if motor will not operate.

(c) Check to see if electric motor is turning in wrong direction.

(d) Check to see if drive coupling is defective.

(e) Check to see if hydraulic fluid is passing over pressure relief valve.

(f) Check for broken piston pump.

(2) Corrective action(s):

(a) Hydraulic pump is not receiving hydraulic fluid.

_1_ Check hydraulic fluid level.

_2_ Clean dirty air breather filter.

_3_ Clean or replace dirty filters and elements.

(b) Motor will not operate.

_1_ Check power supply and electrical wiring connections.

_2_ Replace defective electric motor.

(c) Reverse rotation of electric-motor.

(d) Replace drive coupling.

(e) Hydraulic fluid is passing over pressure relief valve.

_1_ Check pressure of pressure relief valve.

_2_ Replace defective pressure relief valve.

(f) Replace piston pump.

2. Demonstrate troubleshooting procedures for the hydraulic pump.

a. Noisy hydraulic pump.

(1) Possible cause(s):

(a) Check to see if the suction valves are open.

(b) Check the hydraulic oil level in the reservoir.

(c) Check for cavitation (vacuums in hydraulic fluid).

(d) Check for air in hydraulic fluid.

(e) Check to see if drive coupling is misaligned.

(f) Check for worn or damaged hydraulic pump.

(2) Corrective action(s):

(a) Open the suction valves.

(b) Replenish the oil as required.

(c) Cavitation (vacuums in hydraulic fluid).

_1_ Clean or replace dirty air breather filter.

_2_ Clean or replace dirty filters and elements.

(d) Air in hydraulic fluid.

_1_ Secure inlet fittings.

_2_ Check hydraulic fluid level.

_3_ Bleed air from hydraulic system.

(e) Align drive coupling.

(f) Replace hydraulic pump.

b. Excessive wear of hydraulic pump parts.

(1) Possible cause(s):

(a) Check to see if drive coupling is misaligned.

(b) Check to see if air recirculation is causing chatter in hydraulic system.

(c) Check for abrasive material in hydraulic fluid.

(d) Check to see if viscosity of hydraulic fluid is too low for working conditions.

(2) Corrective action(s):

(a) Align drive coupling.

(b) Air recirculation is causing chatter in hydraulic system.

_1_ Secure inlet fittings.

_2_ Check hydraulic fluid level.

(c) Abrasive material in hydraulic fluid.

_1_ Clean or replace dirty filters and elements.

_2_ Change hydraulic fluid.

(d) Check recommendations for hydraulic fluid.

c. External hydraulic fluid leakage around hydraulic pump shaft or housing.

(1) Possible cause(s):

(a) Check for worn hydraulic pump shaft or housing.

(b) Check for worn hydraulic pump head seals.

(c) Check for excessive hydraulic fluid pressure due to excessive drain flow.

(d) Check for cracked hydraulic motor housing.

(2) Corrective action(s):

(a) Replace hydraulic pump.

(b) Replace hydraulic pump.

(c) Replace hydraulic motor.

(d) Replace hydraulic motor.

d. Electric motor will not operate.

(1) Possible cause(s):

(a) Check to see if power supply is disconnected.

(b) Check for defective electric motor.

(2) Corrective action(s):

(a) Reconnect power supply.

(b) Replace electric motor.

3. Demonstrate troubleshooting procedures for hydraulic ramp system.

a. Control valve lever moves but winch does not turn (cable is free to move).

(1) Possible cause(s):

(a) Check to see if power-take-off (PTO) is disengaged.

(b) Check to see if hydraulic diverter valve is set in the RAMP position.

(c) Check to see if oil level in reservoir is low.

(d) Check to see if any hydraulic line has burst.

(2) Corrective action(s):

(a) Engage PTO.

(b) Set hydraulic diverter valve for RAMP operation.

(c) Replenish as necessary.

(d) Notify direct support maintenance.

b. Control valve lever does not move.

(1) Possible cause; Check to see if control valve is seized.

(2) Corrective action; Notify direct support maintenance.

c. Ramp continues to lower with control valve in neutral.

(1) Possible cause; Check to see if lower hand pump shutoff valve is open.

(2) Corrective action; Close lower hand pump shutoff valve.

d. Unusually slow ramp operation.

(1) Possible cause(s):

(a) Check to see if lower hand pump shutoff valve is open.

(b) Check to see if engines are not up to speed.

(c) Check only one pump is engaged.

(2) Corrective action(s):

(a) Close lower hand pump shutoff valve.

(b) Increase engine speed.

(c) Engage both pumps.

e. Hand pump does not develop pressure.

(1) Possible cause; Check to see if hand pump bypass valve is open.

(2) Corrective action; Close hand pump bypass valve.

f. Loss of oil from ramp winch hydraulic motor.

(1) Possible cause; Check to see if motor is defective.

(2) Corrective action; Notify direct support maintenance.

g. Winch will not rotate or rotates slowly.

(1) Possible cause(s):

(a) Check for faulty directional control valve.

(b) Check for faulty directional valve.

(c) Check for faulty relief valve.

(d) Check for gear reducer defective as indicated by grinding noises.

(e) Check for winch shaft binding in shaft mounting bearing as indicated by excessive heat or grinding noise.

(2) Corrective action(s):

(a) Replace valve.

(b) Replace valve.

(c) Replace valve.

(d) Replace defective gear reducer.

(e) Replace defective winch.

h. Emergency handcrank will not rotate clockwise.

(1) Possible cause; Check for insufficient hydraulic fluid in hydraulic brake.

(2) Corrective action; Insert handle in brake release pump and operate pump until brake is released. Turn handle clockwise until hydraulic pressure is restored to hydraulic motor.

i. Winch brake does not release.

(1) Possible cause(s):

(a) Check for foreign material in system.

(b) Check for leaking "O" rings or piston seals.

(c) Check for s rings or piston seals.

(d) Check for seized driven and driving plates.

(2) Corrective action(s):

(a) Flush system completely and clean strainers and filters.

(b) Disassemble winch and replace "O" rings and seals as required.

(c) Disassemble winch and replace "O" rings and seals as required.

(d) Disassemble winch and repair as required.

j. Erratic action of winch.

(1) Possible cause:

(a) Check for defective relief valve.

(b) Check for air in system.

(c) Check to see If winch is defective.

(2) Corrective action:

(a) Disassemble relief valve and inspect plungers, bushings, and pistons for defects.

(b) Tighten leaky connections and purge system.

(c) Notify general support.

k. Tank overflowing.

(1) Possible cause; Check for aeration of oil.

(2) Corrective action; Stop system and allow air to separate from oil.

4. Demonstrate troubleshooting procedures for bow ramp winch.

a. Motor does not start.

(1) Possible cause(s):

(a) Check disconnect switch.

(b) Check fuses (item 1 of Figure 551-88L-3053_01).

(c) Check motor overloads.

(d) Check slack cable and hand crank limit switches (refer to Figure 551-88L-3053_02).

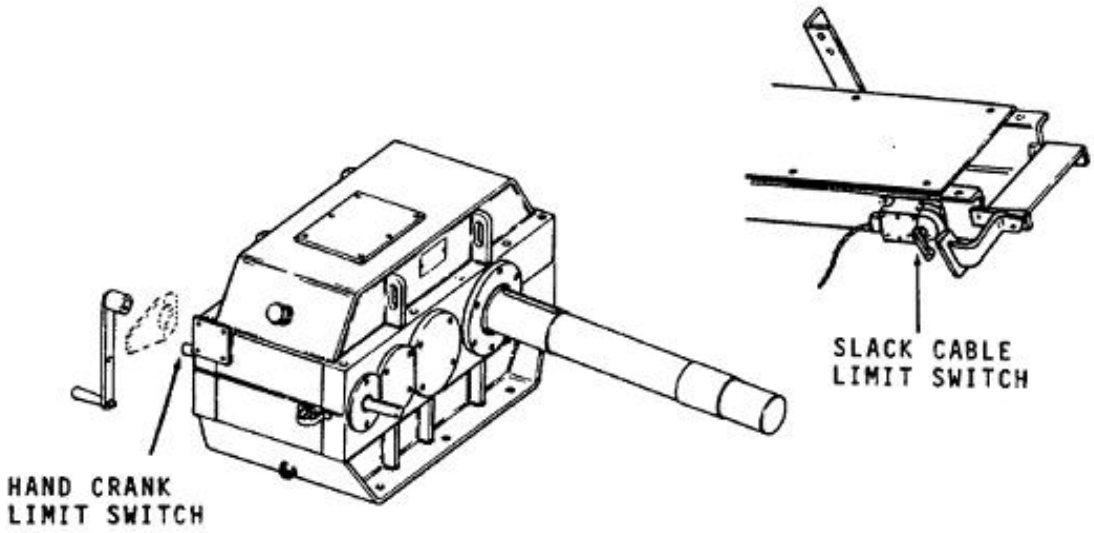
(2) Corrective action(s):

(a) Turn it on.

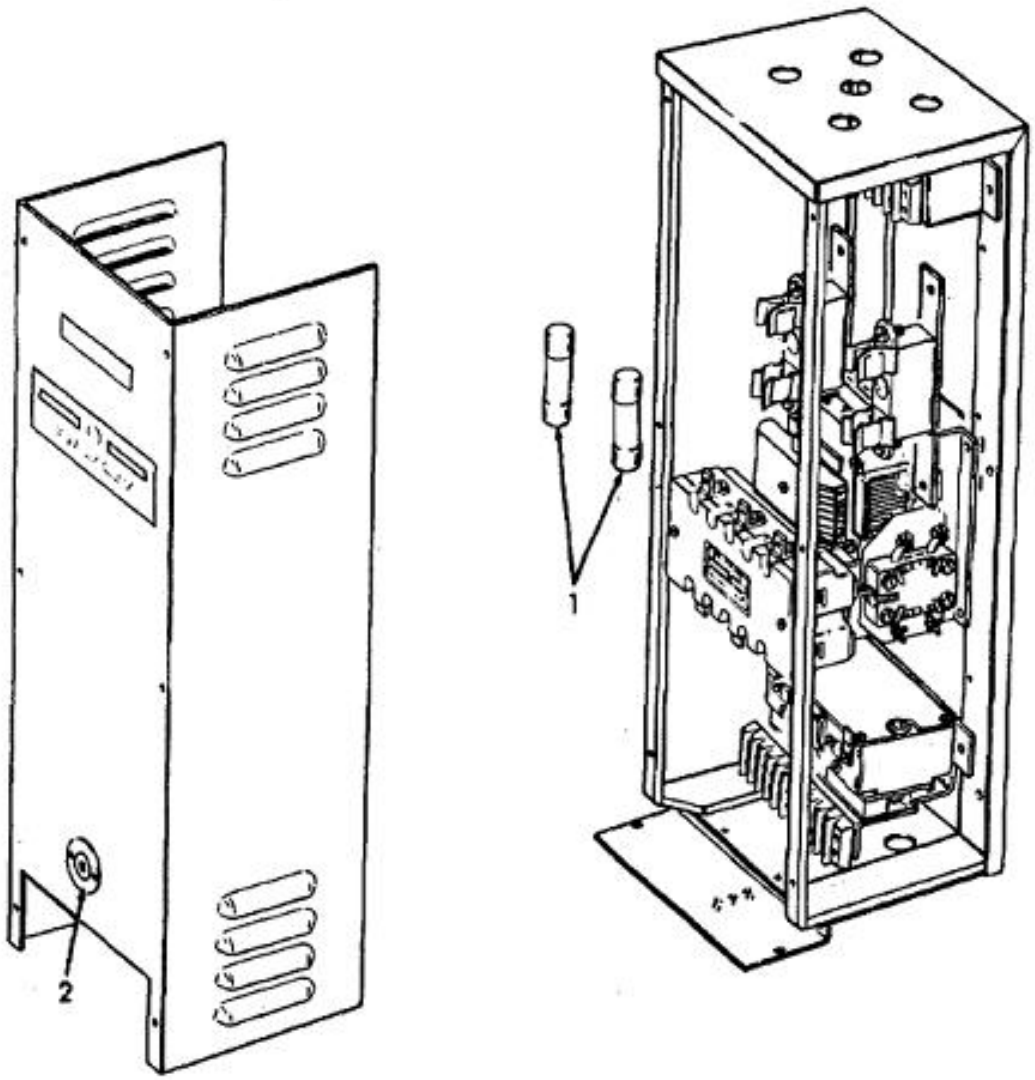
(b) Replace if necessary.

(c) Press reset (item 2 of Figure 551-88L-3053_01). If problem continues, refer to Direct Support Maintenance.

(d) Replace hand operation cover or eliminate slack cable condition.



Slack cable and hand crank limit switches
Figure 551-88L-3053_02



Circuit breaker and fuses)
Figure 551-88L-3053_01

b. Motor runs - shaft does not turn.

(1) Possible cause(s):

(a) Check pawl.

(b) Check torque coupling.

(c) Motor runs - reducer input shaft turns - output shaft does not turn.

(d) Motor runs - reducer output shaft turns - drum does not turn.

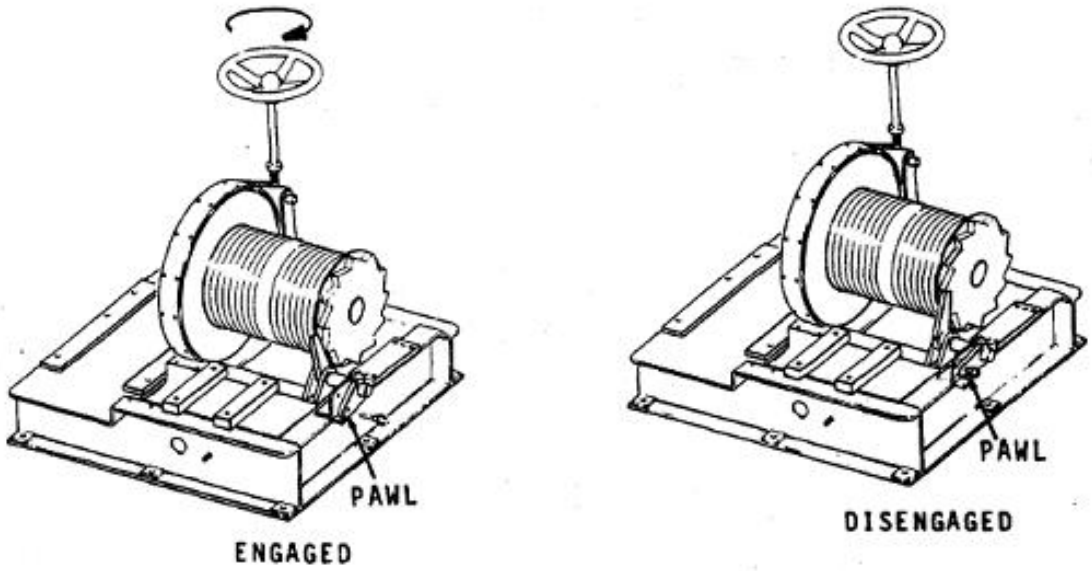
(2) Corrective action(s):

(a) Disengage pawl (refer to Figure 551-88L-3053_03).

(b) Adjust torque coupling.

(c) Internal damage in reducer – Repair/replace reducer.

(d) Sheared key in drum shaft - remove drum and replace key.



Pawl
Figure 551-88L-3053_03

5. Demonstrate troubleshooting procedures for bow ramp winch brake.

a. Brake does not release.

(1) Possible cause(s):

(a) Check for power failure.

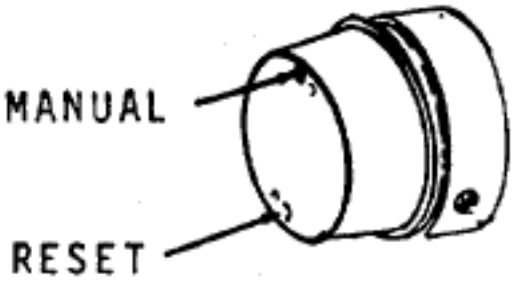
(b) Check for broken or damaged parts.

(c) Check electrical connections.

(d) Check manual release (refer to Figure 551-88L-3053_04).

(e) Check for damaged pressure plate assembly (refer to Figure 551-88L-3053_05).

(f) Check for excessive magnetic gap.



Manual release
Figure 551-88L-3053_04

(2) Corrective action(s):

(a) Check circuit breakers and fuses.

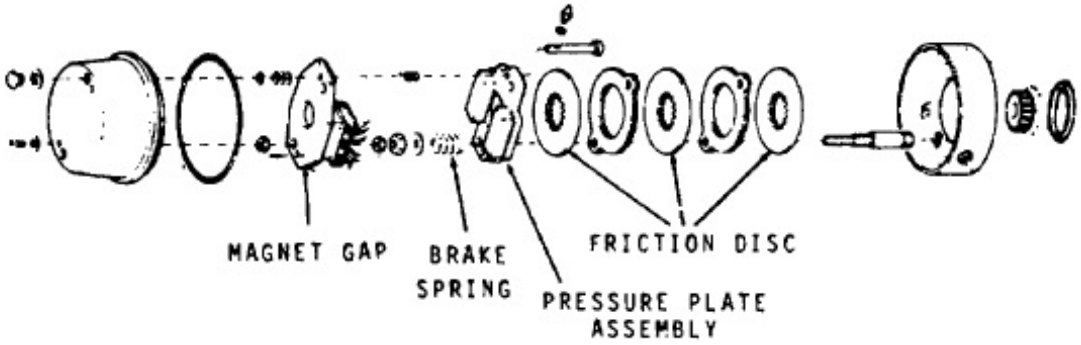
(b) Replace.

(c) Tighten or replace.

(d) Check that it is not stuck.

(e) Replace if magnetic coils are burned or charred.

(f) Readjust gap [max .065 (0.165 cm) min .035 (0.089 cm)].



Pressure plate assembly
Figure 551-88L-3053_05

b. Brake does not stop.

(1) Possible cause(s):

(a) Check manual reset.

(b) Check for broken or worn parts.

(c) Check for friction disc wear.

(d) Check for broken friction disc.

(2) Corrective action(s):

(a) Place in reset position.

(b) Replace.

(c) Readjust gap.

(d) Replace.

c. Brake chatters or hums.

(1) Possible cause(s):

(a) Check for dirt in magnet faces.

(b) Check for parallel magnet faces.

(c) Check for low voltage.

(2) Corrective action(s):

(a) Clean.

(b) Readjust gap [max .065 (0.165 cm) min .035 (0.089 cm)].

(c) Check voltage.

d. Manual release does not work.

(1) Possible cause(s):

(a) Check for broken or damaged parts.

(b) Check brake spring.

(c) Check shim washers.

(d) Check magnet gap.

(2) Corrective action(s):

(a) Replace.

(b) Replace if broken.

(c) Check that quantity is correct under release stop screws.

(d) Readjust.

6. Demonstrate troubleshooting procedures for bow ramp winch motor.

a. Motor does not start.

(1) Possible cause(s):

(a) Check for fuse out, loose or open connection.

(b) Check rotating parts of motor. They may be jammed mechanically.

(c) Check for jammed driven machine.

(d) Check power.

(2) Corrective action(s):

(a) Correct open circuit condition.

(b) Check and correct - Bent shaft. Refer to Direct Support Maintenance any broken housing, damaged bearings, or foreign material in motor.

(c) Correct jammed condition.

(d) Check for voltage at motor and work back to power supply.

b. Motor starts but does not come up to speed.

(1) Possible cause; Check for overload.

(2) Corrective action; Press reset.

c. Motor runs hot (exceeds rating).

(1) Possible cause(s):

(a) Check for overload.

(b) Check for impaired ventilation.

(c) Check for frequent starts or stops.

(d) Check for misalignment between rotor and stator laminations.

(2) Corrective action(s):

(a) Reduce load.

(b) Clean.

(c) Reduce number of starts or reversals.

(d) Realign.

d. Noisy (mechanically).

(1) Possible cause(s):

(a) Inspect for misalignment of coupling or sprocket.

(b) Inspect for mechanical unbalance of rotating parts.

(c) Inspect for lack of or improper lubricant.

(d) Check for foreign material in lubricant.

(e) Check for overload.

(f) Check for dragging rotor due to worm bearings, shaft or bracket.

(2) Corrective action(s):

(a) Correct misalignment.

(b) Find unbalanced part, then balance.

(c) Use correct lubricant, replace parts as necessary.

(d) Clean out and replace bearings.

(e) Remove overload condition. Replace damaged parts.

(f) Replace bearings, shaft or bracket as needed.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: None

Evaluation Preparation: None

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Demonstrated troubleshooting procedures for the hydraulic system.			
a. No pressure in hydraulic system.			
b. Low pressure in hydraulic system.			
c. Erratic pressure in-hydraulic system.			
d. Excessive pressure in hydraulic system.			
e. Excessive temperature in hydraulic system.			
f. Hydraulic fluid does not flow.			
2. Demonstrated troubleshooting procedures for the hydraulic pump.			
a. Noisy hydraulic pump.			
b. Excessive wear of hydraulic pump parts.			
c. External hydraulic fluid leakage around hydraulic pump shaft or housing.			
d. Electric motor will not operate.			
3. Demonstrated troubleshooting procedures for hydraulic ramp system.			
a. Control valve lever moves but winch does not turn (cable is free to move).			
b. Control valve lever does not move.			
c. Ramp continues to lower with control valve in neutral.			
d. Unusually slow ramp operation.			
e. Hand pump does not develop pressure.			
f. Loss of oil from ramp winch hydraulic motor.			
g. Winch will not rotate or rotates slowly.			
h. Emergency handcrank will not rotate clockwise.			
i. Winch brake does not release.			
j. Erratic action of winch.			
k. Tank overflowing.			
4. Demonstrated troubleshooting procedures for bow ramp winch.			
a. Motor does not start.			
b. Motor runs - shaft does not turn.			
5. Demonstrated troubleshooting procedures for bow ramp winch brake.			
a. Brake does not release.			
b. Brake does not stop.			
c. Brake chatters or hums.			
d. Manual release does not work.			
6. Demonstrated troubleshooting procedures for bow ramp winch motor.			
a. Motor does not start.			
b. Motor starts but does not come up to speed.			
c. Motor runs hot (exceeds rating).			
d. Noisy (mechanically).			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	TM 55-1905-217-12	Operator’s and Organizational Maintenance Manual: Landing Craft, Mechanized, Steel, DED, Overall Length 74 Feet, Mod 1, Mark VIII, Navy Design LCM-8, Hull Nos. 8500-8560 and 8580-8618 (NSN 1905-00-935-6057) (Reprinted W/Basic Incl C1-3)	No	No
	TM 55-1905-219-14-3	OPERATORS, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR LANDING CRAFT UTILITY (LCU) 1667-1670 (NSN 1905-00-168-5764)	No	No
	TM 55-1905-221-14-3	OPERATOR, UNIT AND INTERMEDIATE (DIRECT AND GENERAL SUPPORT) MAINTENANCE MANUAL FOR LANDING CRAFT, MECHANIZED STEEL, DED, OVERALL LENGTH 74 FEET, MOD 1, MARK VIII, NAVY DESIGN LCM-8 HULL NUMBERS 8500 THRO	No	No
	TM 55-1905-222-14	OPERATOR, UNIT AND INTERMEDIATE (DIRECT AND GENERAL SUPPORT) MAINTENANCE MANUAL FOR LANDING CRAFT, MECHANIZED (LCM-8) (ROHR AND GUNDERSON MODELS) (NSN 1905-01-284-2647) AND (1905-01-284-2648) (REPRINTED W	No	No
	TM 55-1905-223-24-10	UNIT, INTERMEDIATE DIRECT SUPPORT AND INTERMEDIATE GENERAL SUPPORT MAINTENANCE INSTRUCTIONS FOR BOW RAMP ASSEMBLY FOR LANDING CRAFT UTILITY (LCU) (NSN 1905-01-154-1191) (REPRINTED W/BASIC INCL C1-2) (THIS	No	No
	TM 55-1905-242-14	OPERATOR, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE	No	No
	TM 55-1915-200-10	Operator’s Manual for Logistic Support Vessel (LSV) (NSN 1915-01-153-8801) (Reprinted W/Basic Incl C1-6)	No	No
	TM 55-1915-254-10-1	OPERATOR'S MANUAL FOR LOGISTICS SUPPORT VESSEL (LSV-7 & -8)	No	No
	TM 55-1915-254-10-2	OPERATOR'S MANUAL FOR LOGISTICS SUPPORT VESSEL (LSV-7 & -8)	No	No
	TM 55-1925-204-12	OPERATORS AND ORGANIZATIONAL MAINTENANCE MANUAL FOR TUG, HARBOR, DIESEL, STEEL, 1,200 HP, 100 FOOT DESIGN 3006, FLIGHT ONE (NSN 1925-00-375-3003) (REPRINTED W/BASIC INCL C1-5)	No	No
	TM 55-1925-236-12	OPERATOR AND UNIT MAINTENANCE MANUAL FOR SMALL TUG (ST) (NSN 1925-01-435-1713)	No	No
	TM 55-1925-273-10-1	Operator’s Manual For Inland Coastal Large Tug (LT) (NSN 1925-01-509-7013)(EIC XAG) (This item is included on EM 0272)	No	No

	TM 55-1925-273-10-2	Operator's Manual for Inland and Coastal Large Tug (LT) (NSN 1925-01-509-7013) (EIC XAG) (This item is included on EM 0272)	No	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks :

Task Number	Title	Proponent	Status
551-88L-3052	Trouble Shoot a Hydraulic System	551 - Transportation (Individual)	Approved

Supported Individual Tasks : None

Supported Collective Tasks : None

ICTL Data :

ICTL Title	Personnel Type	MOS Data
88L30 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL3, Duty Pos: TFR, LIC: EN
88L40 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL4, Duty Pos: TGB, LIC: EN, SQI: O